- Infections involving orthopaedic and prosthetic material are most frequently due to Staphylococcus aureus or Staphylococcus epidermidis. These infections are difficult to cure with antibiotics alone and may require extensive debridement and/or removal of the infected prosthesis.
- Note that negative bacterial cultures of joint aspirates or intraoperative joint swabs will not exclude the presence of infection, particularly if the patient is on antibiotics.
- Examination of multiple (at least 5) intraoperative joint biopsies in the absence of antibiotic treatment is recommended when detection of infection with optimal sensitivity is required.

**Investigation:**

- It is important to obtain suitable specimens for culture.
- In chronic infections, sinus cultures may be misleading.
- If cultures are negative and alternative pathology such as malignancy and tuberculosis are ruled out, treat as S. aureus infection.

- Early infection (presenting within 4 weeks after surgery) is usually due to S. aureus.
- For chronic infections, culture is rare if the prosthetic material is not removed. In these patients, removal of the prosthesis with a 2-stage joint replacement (delayed-exchange arthroplasty) and 6 weeks of intravenous antibiotics are the best reported success rates (80% to 90%). One-stage replacement (direct-exchange arthroplasty) may be preferred in some frail patients but the success rate is lower (70% to 80%).

- Septic arthritis generally presents either spontaneously or following penetrating trauma as a monoarticular arthritis.
- The pathogens involved are generally similar to those that cause acute osteomyelitis.
- Diagnostic specimens including a joint aspirate and blood cultures should be obtained prior to the commencement of therapy whenever possible. This allows alternative diagnoses such as acute crystal arthropathies to be firmly ruled in or out.
- It is urgent to drain pus from the infected joint to avoid permanent joint damage and to allow antibiotics to work effectively. The standard method of drainage is arthroscopic washout, or arthrotomy for deeper joints. Repeated simple needle aspiration has been suggested as a less invasive alternative; however, there is insufficient evidence to recommend this.

- Empirical therapy is similar to that of osteomyelitis but should be directed whenever possible by the result of Gram stain of a joint aspirate.
- Adjust therapy according to the culture and susceptibility results.
- For directed therapy of septic arthritis due to organisms other than Staphylococcus aureus, seek advice from an infectious diseases physician or clinical microbiologist.
- Gonococcal arthritis should be treated with cefotaxime or ceftriaxone (as for disseminated gonococcal sepsis) until susceptibility tests are done. Treatment should continue for a total of 7 days. Joint washouts are usually unnecessary.

<table>
<thead>
<tr>
<th>Age group</th>
<th>Duration of antibiotic therapy (modified by clinical response)</th>
<th>Duration of therapy for septic arthritis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infant</td>
<td>6 weeks</td>
<td>2 weeks</td>
</tr>
<tr>
<td>Child</td>
<td>2 weeks (95%)</td>
<td>2 weeks</td>
</tr>
<tr>
<td>Adult</td>
<td>3 weeks</td>
<td>2 weeks</td>
</tr>
</tbody>
</table>

- Septic bursitis is usually caused by Staphylococcus aureus and often follows local trauma. The usual sites are the prepatellar and olecranon bursa.
- Confirm with aspiration and culture.
- Sometimes the underlying joint is also involved.
- Treat with an antistaphylococcal antibiotic for 2 to 3 weeks, as for treatment of Septic arthritis due to S. aureus.
- The infected bursa should be aspirated repeatedly if clinically indicated and may need formal drainage.

- A number of viruses can cause joint inflammation.
- Oligoarthritis or polyarticular disease is more common than monoarticular arthritis.
- Acute rheumatic fever must be excluded.
- Viruses implicated include hepatitis B and C, rubella (and its vaccine), parvovirus B19 and a number of alphaviruses.

**Empirical treatment of septic arthritis**

- For patients with immediate penicillin hypersensitivity and MSSA which is not susceptible to clindamycin (and hence lincosamide) susceptibility, use:
  - clindamycin 450 mg (child: 10 mg/kg up to 450 mg) IV, 8-hourly
  - For patients with immediate penicillin hypersensitivity, use initially:
    - vancomycin 25 mg/kg up to 1 g (child <12 years: 30 mg/kg up to 1 g) IV, 12-hourly
    - Adjust therapy according to culture and susceptibility results.

- Methicillin-susceptible Staphylococcus aureus (MSSA)
  - To treat osteomyelitis due to MSSA, use:
    - flucloxacillin 2 g (child: 50 mg/kg up to 2 g) IV, 6-hourly
  - For patients hypersensitive to penicillin (excluding immediate hypersensitivity), use:
    - cefazolin 2 g (child: 50 mg/kg up to 2 g) IV, 6-hourly
    - OR cefazolin 2 g (child: 50 mg/kg up to 2 g) IV, 8-hourly

- For patients hypersensitive to penicillin (excluding immediate hypersensitivity), use:
  - clindamycin 450 mg (child: 10 mg/kg up to 450 mg) IV, 8-hourly
  - FOR THE COMBINATION
    - flucloxacillin 2 g (child: 50 mg/kg up to 2 g) IV, 8-hourly
    - vancomycin 25 mg/kg up to 1 g (child <12 years: 30 mg/kg up to 1 g) IV, 12-hourly
    - OR clindamycin 450 mg (child: 10 mg/kg up to 450 mg) IV, 8-hourly
    - FOR THE COMBINATION
      - flucloxacillin 2 g (child: 50 mg/kg up to 2 g) IV, 8-hourly
      - For patients with immediate penicillin hypersensitivity use initially:
    - vancomycin 25 mg/kg up to 1 g (child <12 years: 30 mg/kg up to 1 g) IV, 12-hourly
    - For patients with immediate penicillin hypersensitivity use initially:
    - Adjustment therapy according to culture and susceptibility results.

- Methicillin-resistant Staphylococcus aureus (MRSA)
  - To treat osteomyelitis due to MRSA, use:
    - flucloxacillin 2 g (child: 50 mg/kg up to 2 g) IV, 6-hourly
  - For patients hypersensitive to penicillin (excluding immediate hypersensitivity), use:
    - clindamycin 450 mg (child: 10 mg/kg up to 450 mg) IV, 8-hourly
  - For patients with immediate penicillin hypersensitivity and MSSA which is not susceptible to clindamycin (and hence lincosamide), use initially:
    - vancomycin 25 mg/kg up to 1 g (child <12 years: 30 mg/kg up to 1 g) IV, 12-hourly
    - Base oral therapy following vancomycin on proven susceptibility; suitable oral options may be trimethoprim-sulfamethoxazole (dose as for MRSA) or doxycycline 100 mg (child >8 years: 2.5 mg/kg up to 100 mg) orally, 12-hourly.

- For multiresistant MRSA, alternative oral therapies include linezolid and pristinamycin

<table>
<thead>
<tr>
<th>Age group</th>
<th>Duration of antibiotic therapy (modified by clinical response)</th>
<th>Duration of therapy for osteomyelitis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infant</td>
<td>4 weeks (38%)</td>
<td>4 weeks (38%)</td>
</tr>
<tr>
<td>Child</td>
<td>4 weeks (38%)</td>
<td>4 weeks (38%)</td>
</tr>
<tr>
<td>Adult</td>
<td>6 weeks (52%)</td>
<td>6 weeks (52%)</td>
</tr>
</tbody>
</table>

- Although asymptomatic infection and seroconversion with these viruses is common, acute poliomyelitis is not infrequent and may cause severe pain and disability.
- All infections are self-limiting, with joint pain usually resolving within 3 to 6 months.

- As there are no effective antiviral drugs, symptomatic treatment with anti-inflammatory drugs and analgesics is the mainstay of therapy.